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THE GENUS HYMENOSTOMUM IN NORTH AMERICA.

John M. Holzinger.

Have we this genus in North America? This depends somewhat on the point of view. I think we have here a moss which in Europe passes for a Hymenostomum.

Hymenostomum R. Br. in Trans. Linn. Soc., 1819. The following is the historical view of this genus drawn up by Prof. Limpricht in Laubmoose, I, p. 223, 224: "*Hymenostomum* (membrane-mouth or-orifice), founded on *Gymnostosmum microstomum* Hedw., is characterized by the author as a natural genus not merely by reason of characteristic external appearance but by reason of the structure of the capsule. The authors of Bryologia Germanica (1823) emphasize its affinity with *Weisia viridula*, and they include besides *H. rutilans* (Hedw.), also *H. squarrosum* Bryol. Germ., *H. obliquum* N. v. E., *H. brachycarpon* Bryol. Germ., *H. subglobosum* Bryol. Germ., and *H. crispatum* Bryol. Germ.; however the last species is withdrawn again in 1831 by the authors in Bryol. Germ., II. 2. p. 33. Huebener in 1833 considers *H. obliquum* and *H. brachycarpon* as varieties, recognizes *Phascum rostellatum* Brid. as a *Hymenostomum*, designates it however as *H. microstomum* var. *β. mutilatum* Heuben. In Bry. Eur., 1846, *Gymnostomum tortile* Schwaegr. is after Fuernroh's example described as a *Hymenostomum*, however *H. rutilans* (Hedw.) is made a synonym of *Weisia mucronulata* Bruch., and *H. subglobosum* Bryol. Germ. a synonym of *Weisia viridula*; further *H. rostellatum* is treated as an *Astomum*, and by error *H. crispatum* Bryol. Germ. is also removed. C. Mueller in his Synopsis (1849) treated *Hymenostomum* as a subgenus of *Weisia*; so also Juratzka (1882). Schimper in 1860 puts it as a subgenus under *Gymnostomum*, yet *G. rostellatum* is countèd in; in the second edition of the Synopsis (1876) it is again raised to the rank of a genus and *H. unguiculatum* Phil. is added: by gross error *H. crispatum* Bryol. Germ. and *H. murale* (Spruce) are placed here. In Milde, who followed Lindberg, the genus is withdrawn in 1869, and its species are thrown in the subgenus *Euweisia* C. Muell, emend. Lindberg, in 1879, considered *Hymenostomum*, including *Euweisia* C. Muell. and *Astomum* (*Systegium*) as a subgenus of *Mollia* Schrank emend., a genus which in respect to structure of capsule and the anatomy of its stem and of leaf costa comprises in its limits diverse elements. Since according to present views a valid taxonomic arrangement cannot be founded on the structure of vegetative organs merely, *Hymenostomum* is entitled to generic rank, for here in the so-called hymenium of the spore case we find a structure which has its analogue only in the "drumhead," (the epiphragm or diaphragm) of the Polytrichaceæ. Strictly speaking *H. microstomum* and *H. squarrosum* are the only representatives within our territory, for *H. rostellatum* may be viewed as an *Astomum* and *H. tortile* probably does not belong here at all. That *H unguiculatum* Phil. represents a *Trichostomum mutabile* with rudimentary peristome is known; yet *Hymenostomum Muelleri* Bruch from Corsica (Flora, 1829, t. 2

f. 1), judging from the scant material which I examined, I consider a good species. This view is also supported by the description of this species in DeNot. Epil. p. 606."

This historical review is of interest and indeed is essential to a right understanding of what I wish to say regarding a moss which has given me not a little trouble since I found it in April, 1901. It is the *Astomum* sp. mentioned in "Some Notes on Collecting" in the BRYOLOGIST **6**: March, 1903. In November last I found this same moss on the banks of the Mississippi, on Prairie Island, some three miles above Winona. This last collection included many with immature but well nourished and developed capsules, also quite a few fully ripe ones, full of spores. These ripe capsules showed clearly a tendency to a ring of modified cells separating the lid. In February 1902, I sent some of the plants collected on the bluff to Mr. Ernest Salmon, at the Kew Herbarium, to have a comparison made with *Phascum subexsertum* Hook., the type of which I had reason to expect at Kew. Shortly after Mr. Salmon wrote that *P. subexsertum* Hook. cannot now be found. Meanwhile the discovery of a separable lid on the fresh material found, makes it clear that the plant is not a *Phascum* nor an *Astomum* but a *Hymenostomum*. I make it with considerable confidence close to, if not identical with, *Hymenostomum rostellatum* (Brid) Schimp. I reached this conclusion after a painstaking comparison of the plant with Limpricht's description, Laubmoose, p. 224, 225, and with an Italian plant collected near Milan by Mr. F. A. Artaria. Size of spores, cells of exothecium, leaf areolation and shape, all agree perfectly. In both plants the lid separation is equally well indicated. Both lack however the crucial mark the *hymenium*, whether on account of immaturity or for whatever other reason I cannot tell.

Not satisfied that my Italian plants were typical *H. rostellatum* I sent the Minnesota plant to the New York Botanical Garden for comparison with typical European material if possible. Mrs. E. G. Britton very kindly compared the plants, not only favoring me with her judgment but she also sent me a plant or two of each, enough for comparison, of *Astomum multicapsulare*, *Systegium* (*Astomum*) *Ludovicianum* Sulliv., and No. 766 of Crypto. Gerv. des Fichtelgebirges, *Phascum rostellatum* Brid., collected by H. C. Funck. Mrs. Britton correctly points out that No. 766 has a somewhat longer beak than my plant but otherwise it is identical. I can however not agree that it is not near *Systegium Ludovicianum* which has the same leaves and spores of the same size exactly, but its beak is just a trifle shorter. The tendency to a separable lid is here also noticeable, and the conviction has grown on me that *Systegium Ludovicianum* and *Hymenostomum rostellatum* are practically identical, the beak being of somewhat variable length on the material of my own collections, approaching on the one hand the short beak on the single capsule I have seen of Drummond's southern plant (New Orleans, 1841) communicated as *Systegium Ludovicianum*, and on the other hand the somewhat longer beaked plants from the Fichtelgebirge in Europe, the Italian plants holding in this respect the same middle place as my plants. It should be stated that so far as I could measure the spores on the plants sent me by Mrs. Britton I found them to agree exactly in size and rough surface with my plant and that from Italy, but that instead of being 17–22μ as Limpricht records, p. 225 of Vol. I., they are uniformly a little larger, measuring 26–30μ.

What I have now stated will make clear why I think Hooker and Wilson were probably right when they referred our American plants to *H. rostellatum* to which Lesquereux and James did not agree, retaining Sullivant's name (see the Manual, p. 52, under *A. Ludovicianum*). To be sure Limpricht in his historical sketch tells us that *Hymenostomum rostellatum* may also be conceived as an *Astomum* (referring to the European form) which illuminates Hooker and Wilson's name *Phascum crispum rostellatum*, but judging from his practice (See Vol. I., p. 224) he himself considers it a *Hymenostomum*. According to this view *Astomum* (or *Systegium*) *Ludovicianum* Sulliv. becomes a synonym of *Hymenostomum rostellatum* (Brid) Schimp., in addition to the list given by Limpricht. On the other hand if the plant is to be referred to the genus *Astomum* Hampe., or *Systegium* Schimp., where it may stand with perfect propriety, since here also the lid is "distinctly formed but not easily detached," it should be called: *Astomum rostellatum* Bry. Eur., or *Systegium rostellatum* Boulay in Muscinees del Est., p. 586 (1872).

That Hooker and Wilson referred the plant to *Phascum* (*Astomum*) *crispum* as a variety, is very suggestive of the close similarity of the vegetative organs, and a look at Limpricht's synonyms of the European form, ever since Bridel described it as a Phascum, is sufficient to show its ambiguous position. The frequently clustered capsules of the species are referred to, both by Limpricht and in Lesquereux and James, and the somewhat more vigorous and branching habit of Sullivant's plants is purely local, judging from the several American specimens examined. The difference in length of operculum, the European plant being on the whole a little longer beaked, is not emphasized either in plate 12, Bry. Eur., or in Sullivant's Icone, plate 12, a comparison of which shows how slight is this difference, so slight indeed that one would not care to base even a variety on it.

Winona, Minn.

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THE MOSS FLORA OF THE UPPER MINNESOTA RIVER BY JOHN M. HOLZINGER.

A. J. Grout.

This is an interesting report based on collections made under the auspices of the Minnesota Botanical Survey and lists ninety-six species, of which nearly one-half are new to the State, including six new species, five of which are by Cardot and Theriot Two of these new species are forms confessedly near Hypnum riparium, That the polymorphous riparium might be segregated into several fairly well defined groups is almost certain, but it hardly seems worth while, from a scientific point of view, to found new